AD-A253 180

(2)

DTIC
ELECTE
JUL 2 0 1992
S A D

Final Report ONR Grant 91-92
Grant# N00014-91-J-1924
JULY 1992

PAPERS

I finished the following papers during this year.

1. "Pattern Matching: A Sheaf-Theoretic Approach."
   To appear in the proceedings of the Conference on Algebraic Methodology and Software Technology (Iowa City, May 1991), *Lecture Notes in Computer Science*, Springer-Verlag.

2. "A Sheaf Theoretic Approach to Pattern Matching and Related Problems."
   To appear in *Theoretical Computer Science.*

3. "Derivation of a Parallel Matching Algorithm."
   To appear in the proceedings of the Conference on Mathematics of Program Construction (Oxford, June 1992), *Lecture Notes in Computer Science*, Springer-Verlag.

CONFERENCES

I attended the following conferences and gave talks at the last three:

1. IFIP Working Conference on Constructing Programs from Specifications, Asilomar, May 13-16, 1991
2. Conference on Algebraic Methodology and Software Technology, Iowa City, May 21-24, 1991
3. IFIP WG2.1 Meeting, Rio de Janeiro, Jan 19-23, 1992
4. Workshop on Types and Algorithms, New Orleans, May 17-20, 1992

VISITS

I visited the following places, gave talks, and met other researchers:

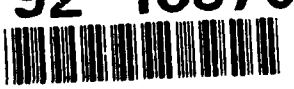
1. University of Pennsylvania, Dec 1991
2. Courant Institute/New York University, Dec 1991
3. Carnegie Mellon University, Dec 1991
4. IBM Yorktown Heights, Dec 1991
5. SRI International, Mar 1992

This document has been approved for public release and sale; its distribution is unlimited.

ACTIVITIES

1. Lectures on category theory at Kestrel, July 1991:
   A series of lectures providing an introduction to category theory to an audience with a background primarily in computer science.
2. Attempted to derive pattern matching algorithms using KIDS:
   I have encoded in KIDS (Kestrel Interactive Development System) some of the theories required for the derivation of a generalized

92-18370



92 7 13 100

Knuth-Morris-Pratt pattern matching algorithm. Deriving the algorithm has proved difficult because of some deficiencies in the KIDS system (lack of higher-order facilities, lack of AC-unfication, etc.). Moreover, my topological approach to data structures is quite different from the first-order theories/algebraic specification based techniques used in KIDS. More work needs to be done to bridge the gap between the two approaches.

3. I explored the relationship between Grothendieck toplogies, sheaves, and algebraic specification. Toplogies seem to provide a better concept of modularity: one can slice specifications at any grain level, thus liberating one from the somewhat arbitrary boundaries imposed by specifications. Such an approach also facilitates the integration of type-theoretic concepts (such as polymorphism, type inference, etc.) and state (especially, objects) into algebraic specification.

Accesion For	
NTIS CRA&I	☑
DTIC TAB	☐
Unannounced	☐
Justification	
By	
Distribution /	
Availability Codes	
Dist	Avail and / or Special
A-1	

Georgia Technology Research Corp.,
Atlanta

Per telecon ONR 7/28/92 cl

Statement A per telecon Ralph Wachter
ONR/Code 1133
Arlington, VA 22217-5000

NWW 7/16/92